

REMARKS

The Examiner has required a restriction/election of currently pending claims 2-37 and 39 as follows:

I. Claims 2-11 and 35-37, drawn to a composition (e.g. biocidal) comprising composite particles of a metal containing core and a pyrithione adduct shell, classified in class 424, subclass 405.

II. Claims 12-24 and 32-34, drawn to a method of making a composite particle copper pyrithione, classified in class 514, subclass 345+

III. Claims 25-31, drawn to a coating composition and method of using it to reduce/inhibit organisms, classified in class 156, subclass 300+

IV. Claim 39, drawn to a shampoo or skin care composition comprising composite particles of a metal core and a pyrithione shell, classified in class 510, subclass 119.

Responsive to the outstanding restriction requirement, Applicant hereby elects Group I with traverse. Regarding the election of species requirement, Applicant elects copper oxide as the metal and sodium pyrithione as the pyrithione compound. Regarding the Examiner's request for a structural formula for the pyrithione species, please refer to column 2 lines 5-16 of U.S. Patent 5,464,622 (copy of page is attached).

MPEP Section 803 states that if a search and examination of all the claims of the entire application can be made without serious burden, the Examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions. In the present situation, no serious burden upon the Examiner is seen by examining all of the claims of the present application.

Therefore, if the Examiner reaffirms this Requirement, claims 2-11 and 35-37 will be examined first. If the Examiner reconsiders the Requirement for the reason mentioned above, it is believed all of the claims should be examined.

Entry of this Amendment is respectfully requested. Claim 2 has been amended to recite that the shell of the composite particle contains a metal pyrithione formed by reaction of pyrithione acid or a water-soluble compound of the core. Support for the term pyrithione acid is supported by the sentence bridging pages 9 and 10 of the instant specification. This reaction product language is supported by the disclosure regarding transchelation reaction product provided in the paragraph bridging pages 9 and 10 of the instant specification. The phrase "water-soluble salt of pyrithione" is supported by the disclosure provided by the paragraph bridging pages 10 and 11 of the instant specification.

Please apply any credits or charge any deficiencies to our Deposit Account No. 23-1665.

Respectfully submitted,
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5,464,622

1

**ANTIMICROBIAL COMPOSITIONS
COMPRISING IODOPROPARGYL
BUTYLCARBAMATE AND
2-MERCAPTOPYRIDINE N-OXIDE AND
METHOD OF CONTROLLING MICROBES**

This application is a continuation of application Ser. No. 619,281, filed Nov. 27, 1990 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to antimicrobial compositions and methods of controlling microbes.

2. Description of the Prior Art

The presence of microbes in various aqueous systems such as latexes, paints, coatings, cooling water systems, decorative ponds and the like, can cause deterioration or disfigurement of these systems. For example, painted surfaces may be disfigured by the unsightly buildup of microbes, thus detracting from the overall aesthetics of the painted article; cooling towers may lose efficiency due to the buildup of microbes on surfaces, thus reducing the heat transfer capabilities of the tower. It is conventional to practice methods which inhibit the microbial deterioration of such systems by incorporating a variety of additives or combination of additives that are characterized by having antimicrobial activity.

A wide variety of materials have been used to control microbes in different environments, some of which are: chlorine/bromine compounds, glutaraldehyde, isothiazolones, organotin formulations, copper salts, quaternary ammonium compounds (SD Strauss and PR Puckorius in *J. Power*, S1, June 1984), and triazines. Each has deficiencies related to toxicity, pH and temperature sensitivity, limited effectiveness, chemical stability, and/or compatibility.

Based on the aforementioned performance deficiencies of conventional antimicrobial compounds there is a need for more effective antimicrobial agents that can be used at lower dosage rates, thus being more cost effective for the end user, reducing the pollution load on the affected environmental systems, and reducing the side effects to nearby non-target organisms, such as fish, useful crops, etc.

Among the many antimicrobial compounds which have been proposed, only a relatively small number have become useful in practice among which are iodopropargyl butylcarbamate and 2-mercaptopyridine n-oxide. However, as far as we know, no one has ever proposed using these two antimicrobials together.

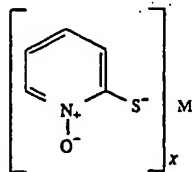
SUMMARY OF THE INVENTION

It is the object of this invention to provide a method of controlling microbes at very low levels of active ingredient. It is a further object to use compositions which are compatible with a variety of systems susceptible to deterioration by microbes. Another object is to provide a method of controlling microbes in cooling towers, paints, marine antifoulant coatings, spray washes, swimming pools, coatings, decorative ponds, fabric, leather, paper, wood, metal working fluids, cosmetic formulations, fuel systems, therapeutic pharmaceutical formulations, and the like, without objectionable by-product odors, discoloration, or otherwise detrimental effects on the treated (and controlled) systems. These objects, and others which will become apparent from the following disclosure, are achieved by the present inven-

2

tion which, in one aspect comprises a composition useful for controlling microbes comprising

(A) a compound (metal salt of 2-mercaptopyridine N-oxide) of the formula



wherein M is a metal cation selected from the group consisting of sodium, potassium, calcium, magnesium and zinc; and where X=1 when M is sodium or potassium and X=2 when M is magnesium, calcium or zinc; and (B) a compound (iodopropargyl butylcarbamate) of the formula



in a ratio to each other which exhibits synergism.

In another aspect, the invention comprises a method for inhibiting the growth of a member selected from the group consisting of bacteria, fungi, algae and mixtures thereof in a locus subject to contamination by said member, which comprises incorporating onto or into the locus, in an amount which is effective to adversely affect the growth of said member, the aforementioned composition.

Another aspect of the invention is a method of controlling microbes in cooling tower water comprising maintaining a concentration of the aforementioned composition in the water.

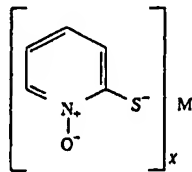
The invention also comprises microbe-resistant coating or impregnant compositions and marine antifoulant compositions comprising the antimicrobial composition.

In a preferred aspect of the invention the antimicrobial composition is incorporated into therapeutic pharmaceutical formulations, e.g., topical antifungal treatments such as shampoos, creams and ointments.

**DETAILED DESCRIPTION OF THE
INVENTION AND THE PREFERRED
EMBODIMENTS**

We have discovered an especially effective composition useful for controlling microbes comprising

(A) a compound (metal salt of 2-mercaptopyridine N-oxide) of the formula



wherein M is a metal cation selected from the group consisting of sodium, potassium, calcium, magnesium and zinc; and where X=1 when M is sodium or potassium and X=2 when M is magnesium, calcium or zinc;